

boro' and Austin, Tex.; 77° at Fort Sill, Ind. Ter.; 76° at Decatur, Tex., South Pueblo, Col., and Daytona, Fla.; 75° at Oglethorpe Barracks, Ga., Clarksville, Tex., and Savannah, Ga.; 74° at Huston, and Jacksonville, Fla.; Quitman, Ga., and Belmont Farm, Tex.; 73° at Weldon, N. C.; 72° at Great Bend and Kingsly, Kan., Fort Barrancas, Fla., Judsonia, Ark., Alto Vista, Va., and Cape Henry; 71° at Augusta, Wilmington, Los Angeles, New Orleans and Fort Monroe, Va.

*Minimum Temperatures*, at Signal Service and voluntary stations, were: —22° at Woodstock, Vt.; —20° at Newport, Vt., and Nile, N. Y.; —19° at Pikes Peak; —18° at Summit, Col., and Billerica, Mass.; —17° at Mt. Washington and Waterbury, N. Y.; —16° at Fort Garland, Col., Cooperstown, N. Y., Orono, Me., and Westboro, Mass.; —15° at Fort Sanders, Wy. Ter., and Dumbarton, N. H.; —14° at Tioga, Pa., Dudley, Col., Detroit, Mich., and Cazenovia, N. Y.; —13° at Wappinger's Falls, N. Y., and Lunenburg, Vt.; —11° at Contoocookville, N. H., and Williamsport, Pa.; —10° at West Waterville, Me., and Palermo, N. Y.; —8° at Waltham, Mass., Franklin, Pa., Mechanic's Falls, Me., Plattsburg Barracks, N. Y., and Fort Fred Steele, Wy. Ter.; —7° at Albany, N. Y.

*Ranges of Temperature*.—Largest monthly and diurnal ranges have been, respectively, as follows: Cheyenne, monthly, 64°, diurnal, 44°; Griffin, 61° and 47°; Stockton, 61° and 46°; McKavitt, 61° and 43°; Yankton, 59° and 32°; Jacksboro', 57° and 41°; Mason, 57° and 40°; Cleveland, 56° and 27°; Breckenridge, 55° and 38°; Fort Sill, 55° and 40°; North Platte, 54° and 36°; Omaha, 52° and 27°; Dodge City, 52° and 37°; Pembina, 52° and 38°; St. Paul, 52° and 32°; Oswego, 52° and 35°; Boston, 52° and 31°.

*Small monthly and diurnal ranges* have been as follows: San Francisco, 20° and 13°; Sacramento, 21° and 16°; Red Bluff, 25° and 22°; Cape Hatteras, 28° and 21°; Boise City, 29° and 21°; Visalia, 30° and 24°; Los Angeles, 30° and 23°; Cape Lookout, 31° and 20°; Indianola, 32° and 23°; Galveston, 33° and 16°; Cairo, 33° and 24°; Smithville, 33° and 25°; Charleston, 35° and 20°; Cape May and Sandy Hook, 36° and 18°; Wood's Holl, 35° and 21°.

*Frosts* have been reported nearly every day in the Northwest, Lake region and northern portion of New England; and in the other sections east of the Rocky Mountains, generally from the 1st to the 6th, 11th to 13th, on the 19th and 20 and from the 26th to the 28th.

*Ice* is reported to have formed as follows: In Kansas from the 1st to the 4th, 9th to 12th, and on the 24th; in Texas on the 11th; Mississippi, 1st, 5th, 11th and 12th; Florida, 12th; New Jersey, 7th and 18th, and in Massachusetts on the 21st.

## PRECIPITATION.

*In General*.—The general distribution of rain (and melted snow) for the month, is shown on Chart No. III. By reference to the table in the lower left hand corner of same Chart, it will be seen that there has been a very large excess in the Pacific coast States, and a general deficiency east of the Rocky Mountains, which is most marked in Tennessee, the Ohio valley, East Gulf and Middle Atlantic States. In the Lower Lake region and New England, a small excess occurs. The heavy rains in the Pacific States, resulted in extensive flows, of which a short account is given below.

*Special Heavy Rains*.—1st, Westboro, Mass., 2.39 inches. 6th, Baton Rouge Barracks, La., 1.85 in.; New Orleans, La., (6th and 7th) 2.08 in.; Denison, Tex., (6th and 7th) 2.27 in.; Corsicana, Tex., (6th and 7th) 2.22 in. 14th, Spring Garden, Tenn., (14 and 15th) 2.40 in.; Red Bluff, Cal., (13 and 14th) 3.25 in. 15th, Los Angeles, Cal., 1.78 in.; Santa Cruz, Cal., 1.70 in. 17th, Red Bluff, Cal., 2.41 in.; San Francisco, Cal., 1.92 in.; 20th, Red Bluff, Cal., 2.02 in.; Fort Gibson, Ind. Ty., 2.06 in. 22nd, New York City, 2.11 in.; New Haven, Conn., 4.13 in.; Springfield, Mass., 2.20 in.; Westboro, Mass., 2.51 in.; West Chester, Pa., 2.36 in.; Green Castle, Pa., (21st and 22nd) 2.07 in.; Thatcher's Island, Mass., 3.01 in.; Fort Preble, Me., 3.30 in.; Alpena, Mich., (21st and 22d) 2.34 in.; Wilmington, N. C., (21st and 22) 2.26 in. 25th, Fort Duncan, Tex., 1.80 in.; Red Bluff, 1.99 in.

*Large Monthly Rain-falls*.—At Red Bluff, Cal., 16.66 in.; Santa Cruz, Cal., 16.04 in.; Olympia, Wash. Ty., 15.50 in.; San Francisco, Cal., 12.52 in.; Portland, Or., 12.16 in.; Okahumpka, Fla., 10.80 in.; Salinas, Cal., 8.77 in.; Sacramento, Cal., 8.07 in.; Los Angeles, Cal., 7.68 in.; Daytona, Fla., 7.64 in.; Roseburg, Or., 7.30 in.; Cambridge, Mass., 6.59 in.; New Haven, Conn., 6.40 in.; Westboro, Mass., 6.12 in.; Spring Garden, Tenn., 6.00 in.

*Small Monthly Rain-falls*.—At Fort Lyon, Col., Vail, Iowa, and Fort Hartsuff, Neb., none; Fort Union, N. M., trace; Fort Griffin, Tex., 0.02 in.; Sydney Barracks, Neb., 0.06 in.; Yuma, A. T., 0.06 in.; Cheyenne, Wy. Ty., 0.13 in.; Omaha, Neb., 0.14 in.; Plattsmouth, Neb., 0.15 in.; Fort McPherson, Neb., and Tabor, Iowa, 0.16 in.; De Soto and North Platte, Neb. and Breckenridge, Minn., 0.18 in.; Boonsboro, Iowa, 0.20 in.; Fort Pembina, D. T. and Norfolk, Neb., 0.21 in.; Clear Creek, Neb., 0.25 in.

*Floods*.—Valley of the Sacramento, Cal.—During the latter half of January the Sacramento river gradually rose, reaching 22 ft. 3 in. above low water mark at Sacramento City on the 31st. It continued rising until the 5th of February, 2 a. m., when 24 ft. 11 in. was recorded, being one inch higher than any previous record, (highest heretofore 24 ft. 10 in., March, 1876.) Between 2.30 and 3 a. m. a break occurred in the levee on east bank of river, about one mile below Sacramento City, flooding an immense track of country in Sacramento county, and, by backing up, flooded all the southern portion of city on the 6th. After the 6th the river gradually fell until the 12th, when it commenced rising, the water being backed by the high southeast gales during the night of the 12th and 13th. At 3 p. m., 13th, 23 feet 11 in. was re-

corded. During the 12th the Washington river also rose, owing to a heavy snow and rain storm in the mountains. By this time the flood had spread over a great portion of Yolo Co., and the water on the 11th was within three miles of Woodland, forming a vast lake to the north and south. On the 13th it extended eighteen miles below Sacramento. On the 14th the water fell somewhat, but rose again on the 15th, reaching 24 ft. 1 inch, at noon of the 15th, 16th and 17th. On the 17th very heavy rains fell in the Upper Sacramento valley and heavy snows on the mountains, and during the afternoon the river rose at the rate of one foot per hour at Red Bluff; at 9 p. m., 24 feet above low-water mark was recorded and still rising at midnight; numerous breaks occurred in the levees on the Yolo side of the river, and 100 feet of the Sacramento Valley railroad track was washed away at Lexington Crossing. On the 18th the water again rose at Sacramento city, and the upward tendency continued until 7:40 p. m. of the 20th, when 25 feet 11½ inches was recorded, the water reaching Front-street railroad track, and being the highest ever known. By 2:45 p. m. it had fallen to 24 ft. 8 in., and the decline continued to end of month. At noon of the 20th the levee below Washington gave way, and on the 21st the town was almost totally inundated, houses were swept away, and the crevasses in Yolo county exceeded six miles in extent. Extensive overflows also occurred in Colusa county, and in Sutter county a track of country, 15 to 20 miles long and 8 miles wide, was covered to an average depth of 4 to 6 feet. On the 21st the levees protecting the islands in the delta of the Sacramento gave way, and Andros, Brannan and Grand islands were almost entirely submerged, with immense loss of property. At the close of the month reports from Sacramento say the whole of Sacramento valley, on both sides of the river, for a distance of 150 miles, is under water, excepting a few well-guarded cities and towns. In Washington the streets were still several feet under water, and houses were being undermined and careening over. A report from Camanche, Calaveras Co., Cal., says that on the 17th, 4:30 p. m., during a heavy rain-storm, a cloud burst in the hills south of here; four funnel-shaped clouds were observed passing in a northeasterly direction, apparently accompanied by heavy precipitation. Soon the slopes of the hills were covered with torrents of water. In a few minutes a bank of water, several feet in height, swept down Comanche creek, flooding flats on either side, carrying away houses, etc., and drowning ten persons in Chinatown. On the 22nd, at Meriden, Conn., flats along Harbor Brook completely submerged; streets flooded; heavy freshet in Moshansuck river, flooding northern portion of Providence, R. I. Tioga river very high at Elmira, N. Y.; lower portion of city flooded. At Port Hope and Oshawa, Ontario, severe floods also occurred.

*Hail.*—4th, Lenoir, N. C.; 6th, Visalia, Cal., Galveston; 7th, Santa Fe, N. M., Augusta, Forsyth, Ga.; 9th, Nashville, Jacksonville, Mayport, Fla., Danville, Ky., West Waterville, Me., Wytheville, Va.; 10th, Knoxville, Norfolk, Cape Henry, McPherson Bks., Ga., Ft. Independence, Mass., Springfield, Mass., Weldon, N. C., Wytheville, Va.; 13th, Visalia, Cal., Santa Cruz, Cal., Brockhaven, Miss., Fayette, Miss., 15th, Montgomery, St. Marks; 18th, Salt Lake City; 19th, McKavitt, Tex., stones one inch in diameter, Davenport, Elmira and Genessee, Ill.; 20th, Mobile, Independence, Kan., Baxter Springs, Kan., Brockhaven, Miss., Wappingers Falls, N. Y., Clarksville, Tex.; 21st, Highlands, N. C., McMinnville, Tenn.; 22nd, Cornish, Me., West Waterville, Me., Standish, Me., Springfield, Mass., Westboro, Mass., Flatonia, Tex., Woodstock, Vt., Mt. Charlotte, Vt.; 23rd, Mt. Desert, Me.; 25th, Sandy Springs, Md.; 26th, Ft. McHenry, Md., Santa Cruz, Cal., Creswell, Kan., and at Laredo, Tex., stones ¼ inch in diameter; 28th, Santa Fe, N. M.

*Sleet.*—1st, Woods Holl, New London; 8th, Davenport, Detroit; 9th, Oswego, Erie, Indianapolis, Bangor, Me., Detroit; 10th, New Haven, Conn., Boston, Ft. Independence, Mass., West Point, N. Y.; 12th, Cresco, Iowa; 13th, Keokuk, McPherson Bks., Ga.; 14th, Davenport, Oregon, Mo.; 16th, Cleveland, Cresco, Iowa; 18th, Auburn, N. H.; 19th, Detroit; 20th, South Pueblo, Cal.; 21st, Dubuque; 22nd, Eastport, Newbury, Vt., Boston, Cornish, Me., Rowe, Mass., Westboro, Mass.; 23rd, Bangor, Me., Plattsburg Bks., N. Y., Cresco, Iowa; 24th, Cresco, Iowa;

*Depth of snow at close of month.*—In New England, ¼ to 15 inches; on summit of Mt. Washington, 40 in.; in the Middle Atlantic States, 0.50 to 4 in.; in the Upper Lakes, 0.25 to 3 in.; Indiana, 0.25 in.; Kansas, 2.50 in.; Summit, Col., 50 in.; Pike's Peak, 24 in.; Bismarck, a trace; Salt Lake City, 1 in.; Santa Fe, N. M., 2 in.

*Rainy days.*—The number of days on which rain or snow has fallen averages as follows: New England, 5 to 13; Middle Atlantic States, 2 to 14; South Atlantic States, 8 to 15; East Gulf States, 5 to 8; West Gulf States, 3 to 8; Lower Lake region, 14 to 20; Upper Lake region, 7 to 15; Upper Mississippi valley, 3 to 16; Lower Missouri valley, 4 to 10; Tennessee and the Ohio valley, 2 to 15; Northwest, 2 to 7; Rock Mountain region, 7 to 19; California, 14 to 21.

*Cloudy days.*—New England, 4 to 12; Middle Atlantic States, 5 to 22; South Atlantic States, 4 to 18; East Gulf States, 0 to 14; West Gulf States, 0 to 7; Lower Lake region, 11 to 16; Upper Lake region, 8 to 17; Upper Mississippi valley, 8 to 14; Lower Missouri valley, 5 to 14; Tennessee and the Ohio valley, 13 to 18; Northwest, 9 to 15; Rocky Mountain region, 2 to 14; California, 9 to 15.

*Precipitation from a cloudless sky.*—At Summit, Col., on 3rd, as snow. At Vevay, Ind., 8th, as rain.

## RELATIVE HUMIDITY.

The average percentage of relative humidity for the month ranges about as follows: New England, 64 to 82; Middle Atlantic States, 57 to 81; South Atlantic States, 67 to 80; East Gulf States, 63 to 75; West Gulf States, 64 to 72; Lower Lake region, 67 to 80; Upper Lake region, 63 to 82; Tennessee and the Ohio valley, 64 to 74; Upper Mississippi valley, 62 to 72; Lower Missouri valley, 65 to 75; California coast, 69 to 75; Sacramento valley, 78 to 80. High stations report the following monthly average percentages not